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EXAMINER

GARRETT, DAWN L

ART UNIT

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1794

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to the amendment file March 20, 2008. Claims 29-32 were added. Claims 1-32 are pending. Claims 5-8 are withdrawn as non-elected. Claims 1-4 and 6-32 are currently under consideration. Applicant previously elected the species of claim 4 which includes a host material according to formula (7) wherein an aryl group represents each of R1 to R3 and formula 8 wherein a lower alkyl group represents R1, R4, and R5 and a hydrogen atom represents each of R2 and R3.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 30-32 are directed to limitations regarding variables R2 to R5. Claim 2 recites formulas 3 and 4 that both comprise R2 to R5 variables and therefore it is unclear if claim 30 is directed to both of the formulas or just one of the formulas. Claim 3 recites formulas 5 and 6 that both recite R2 to R5 variables and therefore it is unclear if claim 31 is directed to both of the formulas or just one of the formulas. Claim 4 recites formulas 7 and 8 that both recite variables R2 to R3 and therefore it is unclear if claim 32 is directed to both of the formulas or just one of the formulas. Further with regard to claim 32, R2 for formula 7 in parent claim 4 is more limited

than the definition provided in dependent claim 32. Accordingly, the claim is indefinite.

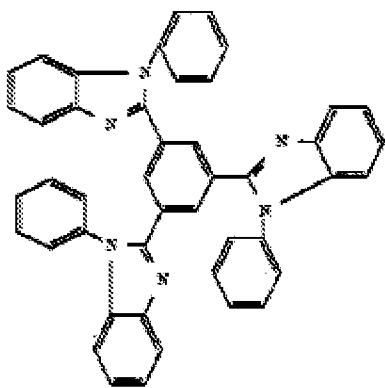
Clarification and/or correction are required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 10-14, 16-24, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,645,948) in view of Xie et al. (US 2003/0215667 A1). Shi et al. describes organic electroluminescent devices comprising a host material for the luminescent layer according to the elected host species:

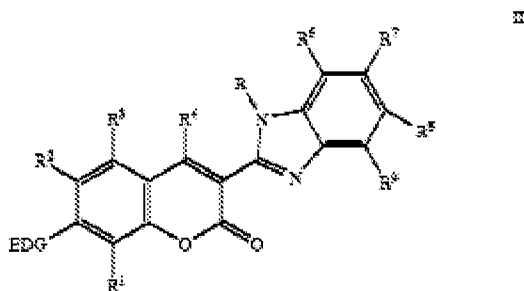


(see col. 8, lines 1-13, columns 11 and 12, bottom of page).

Dopants for the luminescent layer include coumarin derivatives (see col. 7, lines 61-65). Shi et al. is silent with respect to the *specific* coumarin derivative according to the elected guest material species. Xie teaches, in analogous art, coumarin derivatives useful as dopants in the

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luminescent layer of an electroluminescent device (see abstract). Xie teaches the species of coumarin derivative currently under consideration:



[0026] Wherein R is hydrogen, alkyl of from 1-24 carbon atoms, aryl, heteroaryl or carbocyclic systems;

[0027] R¹, R², R³, R⁴, R⁵, R⁶, R⁷, R⁸ and R⁹ are individually alkyl of from 1 to 20 carbon atoms, aryl or carbocyclic systems;

[0028] EDG is hydrogen, alkyl group of from 1-24 carbon atoms, aryl group of from 5-24 carbon atoms, or electron donating groups, more typically are:



[0029] Wherein: R¹⁰, R¹¹ and R¹² are individually alkyl of from 1 to 20 carbon atoms, aryl or carbocyclic systems; R¹¹ and R¹², R¹¹ and R¹³, and R¹² and R¹³ taken together can form ring systems, such as piperidine, piperoline, or tetramethylpiperidine.

(see page 2, par. 25-29 and p. 13).

It would have been obvious to one of ordinary skill in the art to have selected a coumarin derivative according to Xie for the Shi et al. device, because Shi et al. teaches coumarin derivatives are desired as dopant (guest) material for incorporation into the light emitting layer.

With regard to claims 10 and 11, the positive electrode (anode) may be formed of a number of materials including indium tin oxide (see col. 26, lines 35-44). With regard to claims 12-14, the negative electrode (cathode) may be formed of the required metals such as Mg:Ag (see col. 26, lines 49-57 and cathodes in Examples). ITO (indium tin oxide) is transparent per

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claim 16. An electron transporting layer may be included per claims 18 and 23 (see col. 25, lines 21-65). A hole injecting layer may be included per claims 19 and 24 (see col. 4, lines 29-36).

With regard to claim 20, an *electron transporting* layer inherently has the function of *blocking holes* (see col. 25, lines 21-65).

6. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,645,948) in view of Xie et al. (US 2003/0215667 A1) in further view of Okada et al. (US 2002/0055014 A1). Shi and Xie are relied upon as set forth above. Shi is silent with respect to the how the device is incorporated into an apparatus and the thickness of the anode for the device. Okada teaches, in analogous art, with respect to claim 9, devices are used for displays and displays are notoriously well known to be part of image reproduction devices, goggle type displays, cameras, and cellular phones (see Okada par. 5). Regarding the appropriate thickness for an anode and cathode of a device, Okada teaches in analogous art the formation of electrodes may be in a thickness of 10 nm (see par. 218 and 222). It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the Shi devices into a display and to have formed the electrodes (anode and cathode) in a thickness according to the teachings of Okada, because one would expect the devices to be useful in a display and to function with a conventional thickness for electrodes with a predictable result as a functional light emitting device.

7. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,645,948) in view of Xie et al. (US 2003/0215667 A1) in further view of Kawami et al. (US 5,929,561). Shi and Xie are relied upon as set forth above, but fail to mention specifically that the light emitting devices may be used as pixels for a display device. Kawami et al. teaches

in analogous art it is well known that an electroluminescent element may be incorporated as pixels in various display devices (see col. 1, lines 14-29). It would have been obvious for one of ordinary skill in the art at the time of the invention to have incorporated the devices rendered obvious by Shi in view of Xie as a pixel portion in a display, because Kawami et al. teaches it is well known that devices are used as pixels in various displays.

Response to Arguments

8. Applicant's arguments filed March 20, 2008 have been fully considered but they are not persuasive.

Applicant argues the prior art does not teach or suggest an electroluminescent layer with a host and a guest material that both have a benzimidazole skeleton. The examiner submits the primary reference, Shi, clearly teaches the required host material and also teaches coumarin derivatives as particularly preferred (see col. 7, l. 61-65). The secondary reference Xie is relied upon to teach well known *specific* coumarin derivatives. The comparative examples in the specification are not commensurate in scope with the closest prior art, because the comparative examples use a host material that is completely outside the scope of the instant claims while Shi clearly teaches the required host material.

With regard to selection of the particular coumarin derivative from Xie for use in the Shi device, applicant argues there are an infinite number of coumarin derivatives; however, it is not seen where applicant has clearly demonstrated that coumarin derivatives outside the scope of the instant claims are inferior to the particular coumarin derivatives taught by Xie. Applicant has not shown comparison data using the host material taught by Shi in combination with coumarins that are considered to be inferior as compared to the coumarin compounds intended by applicant.

Applicant points to the par. 27 description of Xie formula II as not teaching the formula 8 compound with the required hydrogens; however, the entire disclosure of Xie, particularly page 13 table, clearly exemplifies many specific formula II derivatives comprising hydrogen for variables R1 to R9. Applicant should be apprised of the full disclosure of formula II compounds in the Xie reference, since the entire document is cited in the rejection. Compounds IIb-7 and IIb-8 (p. 13) in particular are according to the species under consideration.

With regard to new claims 29-32, the species under consideration are within the compounds recited in the new claims. Claims 29-32 have been rejected for the reasons set forth in the above rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571) 272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dawn Garrett/
Primary Examiner, Art Unit 1794

June 10, 2008